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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/325,099	06/03/1999	ALEXANDER SHVARTS	4498	2396

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EXAMINER	
FAN, CHIEH M	
ART UNIT	**PAPER NUMBER**
2634	17

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/325,099	Applicant(s) SHVARTS ET AL.	
	Examiner Chieh M Fan	Art Unit 2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,7-12,14 and 16-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,7-12,14,16-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5, 7-10, 14, 16-19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzinger (EP 0,905,879) in view of Damgaard et al. (U.S. Patent No. 6,208,875, "Damgaard" hereinafter).

Regarding claim **1**, Herzinger discloses a translation loop modulator (see Fig. 2 and the English abstract) for transmission circuit in a communication system, said translation loop modulator comprising:

input modulation means ("QM" and "BP" in Fig. 2) for receiving at least one input signal ("f_I" and "f_Q" in Fig. 2) that is representative of information to be modulated, for receiving a feedback signal ("f_{MO}" in Fig. 2), and for producing an intermediate modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal;

comparator means ("FT1", "FT2", "PFD", "CP", "LF" and "HF-VCO" in Fig. 2) for receiving said intermediate modulated signal (output from "BP" in Fig. 2) and a

reference signal ("f_{LO}" in Fig. 2) having a frequency of F_{LO}, and for producing an output transmission signal ("A" in Fig. 2) having a frequency of F_{OUT} responsive to said intermediate modulated signal and said reference signal, wherein said comparator means includes a first frequency divider unit ("FT1" in Fig. 2) for providing a to divide by m function and a second frequency divider unit ("FT2" in Fig. 2) for providing a divide by n function such that $F_{LO} = F_{OUT} / (1 - m/n)$ (see the mathematical expression in col. 4, line 49, also see right column on page 3 of the English translation of DE 19743207 provided by the applicant), and

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal ("A" in Fig. 2), coupled to said reference signal ("f_{LO}" in Fig. 2) and coupled to said input modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for producing said feedback signal ("f_{MO}" in Fig. 2) responsive to said output transmission signal and said reference signal.

Herzinger does not teach that the translation loop modulator may be operated in a second mode such that $F_{LO} = F_{OUT} / (1 + m/n)$. That is, Herzinger does not teach the feature of dual band operation.

However, Damgaard teaches that there is a need for mobile phones to operate with dual band transmissions to increase system capacity, so that the system could select between two transmission frequency bands depending upon which bandwidth is less saturated and could provide a better signal quality (col. 1, lines 30-35). Damgaard also teaches the dual operation may be achieved by selecting the output of a mixer (with inputs RF_{OUT} and RF_{LO}) to be either $RF_{OUT} – RF_{LO}$ or RF_{LO} - RF_{OUT} (col. 5, lines

53-62). When the mobile phone is operated in GSM mode, RF_{LO} - RF_{OUT} is selected. When the mobile phone is operated in DCS mode, RF_{OUT} - RF_{LO} is selected. (See col. 6, line 49 through col. 7, line 8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the output of the mixer ("M1" in Fig. 2) of Herzinger to be either $RF_{VCO} - RF_{LO}$ or $RF_{LO} - RF_{VCO}$ such that the modulator of Herzinger may be operated in dual band (DCS mode and GSM mode) for the advantage of increasing system capacity. Note that the relationship $F_{LO} = F_{OUT} / (1 + m/n)$ is an inherent property when the DCS mode (i.e., $RF_{VCO} - RF_{LO}$) is selected. Such relationship may be derived by simple mathematical manipulations.

Regarding claim **5**, Herzinger also teaches an input port of said second frequency divider unit ("FT2" in Fig. 2) is coupled to said reference signal ("f_{LO}" output from "LO" in Fig. 2), and an output port of said second frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **7**, Herzinger also teaches an input port of said first frequency divider unit ("FT1" in Fig. 2) is coupled to said intermediate modulated signal (the output from "BP" in Fig. 2), and said output port of said first frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **8**, Herzinger also teaches said feedback circuitry ("M1" and TP" in Fig. 2) includes a mixer device ("M1" in Fig. 2) including a first input port coupled to said output transmission signal ("A" in Fig. 2), a second input port coupled to said

reference signal ("f_{LO}" in Fig. 2), and an output port coupled to said feedback signal ("f_{MO}" in Fig. 2).

Regarding claim **9**, Herzinger also teaches said reference signal is directly connected to said mixer device (as seen in Fig. 2, the reference signal "f_{LO}" is directly connected to the mixer device "M1").

Regarding claim **10**, Herzinger teaches a translation loop modulator (see Fig. 2 and the English abstract) for a transmission circuit in a communication system, said translation loop modulator comprising:

quadrature modulation means ("QM" and "BP" in Fig. 2) for receiving at least one input signal ("f_I" and "f_Q" in Fig. 2) that is representative of information to be modulated, for receiving a feedback signal ("f_{MO}" in Fig. 2), and for producing an quadrature modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal;

phase comparator means ("FT1", "FT2", "PFD", "CP", and "LF" in Fig. 2) for receiving said quadrature modulated signal (output from "BP" in Fig. 2) and a reference signal ("f_{LO}" in Fig. 2) having a frequency F_{LO}, and for producing a phase comparator signal (output from "LF" in Fig. 2) responsive to said quadrature modulated signal and said reference signal, said phase comparator means including a first frequency divider unit ("FT1" in Fig. 2) for providing a divide by m function and a second frequency divider unit ("FT2" in Fig. 2) for providing a divide by n function;

oscillator means ("HF-VCO" in Fig. 2) for receiving said phase comparator signal (output from "LF" in Fig. 2), and for producing an output transmission signal ("A" in Fig.

2) responsive to said phase comparator signal, said output transmission signal having a frequency F_{OUT} wherein $F_{OUT} = F_{LO} (1 - m/n)$ (see the mathematical expression in col. 4, line 49, also see right column on page 3 of the English translation of DE 19743207 provided by the applicant); and

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal ("A" in Fig. 2), coupled to said reference signal ("f_{LO}" in Fig. 2) and coupled to said quadrature modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for producing said feedback signal ("f_{MO}" in Fig. 2) responsive to said output transmission signal and said reference signal.

Herzinger does not teach that the translation loop modulator may be operated in a second mode such that $F_{LO} = F_{OUT} / (1 + m/n)$. That is, Herzinger does not teach the feature of dual band operation.

However, Damgaard teaches that there is a need for mobile phones to operate with dual band transmissions to increase system capacity, so that the system could select between two transmission frequency bands depending upon which bandwidth is less saturated and could provide a better signal quality (col. 1, lines 30-35). Damgaard also teaches the dual operation may be achieved by selecting the output of a mixer (with inputs RF_{OUT} and RF_{LO}) to be either $RF_{OUT} – RF_{LO}$ or $RF_{LO} - RF_{OUT}$ (col. 5, lines 53-62). When the mobile phone is operated in GSM mode, $RF_{LO} - RF_{OUT}$ is selected. When the mobile phone is operated in DCS mode, $RF_{OUT} - RF_{LO}$ is selected. (See col. 6, line 49 through col. 7, line 8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the output of the mixer ("M1" in Fig. 2) of Herzinger to be either $RF_{VCO} - RF_{LO}$ or $RF_{LO} - RF_{VCO}$ such that the modulator of Herzinger may be operated in dual band (DCS mode and GSM mode) for the advantage of increasing system capacity. Note that the relationship $F_{LO} = F_{OUT} / (1 + m/n)$ is an inherent property when the DCS mode (i.e., $RF_{VCO} - RF_{LO}$) is selected. Such relationship may be derived by simple mathematical manipulations.

Regarding claim **14**, Herzinger also teaches an input port of said second frequency divider unit ("FT2" in Fig. 2) is coupled to said reference signal ("f_{LO}" output from "LO" in Fig. 2), and an output port of said second frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **16**, Herzinger also teaches an input port of said first frequency divider unit ("FT1" in Fig. 2) is coupled to said intermediate modulated signal (the output from "BP" in Fig. 2), and an output port of said first frequency divider unit is coupled to a phase comparator device ("PFD" in Fig. 2).

Regarding claim **17**, Herzinger also teaches said feedback circuitry ("M1" and TP" in Fig. 2) includes a mixer device ("M1" in Fig. 2) including a first input port coupled to said output transmission signal ("A" in Fig. 2), a second input port coupled to said reference signal ("f_{LO}" in Fig. 2), and an output port coupled to said feedback signal ("f_{MO}" in Fig. 2).

Regarding claim **18**, Herzinger also teaches said reference signal is directly connected to said mixer device (as seen in Fig. 2, the reference signal "f_{LO}" is directly connected to the mixer device "M1").

Regarding claim **19**, Herzinger teaches a translation loop modulator (see Fig. 2 and the English abstract) for a transmission circuit in a communication system, said translation loop modulator comprising:

quadrature modulation means ("QM" and "BP" in Fig. 2) for receiving at least one input signal ("f_I" and "f_Q" in Fig. 2) that is representative of information to be modulated, for receiving a feedback signal ("f_{MO}" in Fig. 2), and for producing an quadrature modulated signal (output from "BP" in Fig. 2) responsive to said input signal and said feedback signal;

first frequency divider means ("FT1" in Fig. 2) for receiving said quadrature modulated signal (output from "BP" in Fig. 2), and for producing a first frequency divided signal (output from "FT1" in Fig. 2) responsive to said quadrature modulated signal such that said first frequency divider means provides a divide by m function;

second frequency divider means ("FT2" in Fig. 2) for receiving a reference signal ("f_{LO}" in Fig. 2), and for producing a second frequency divided signal ("f_{PD}" in Fig. 2) responsive to said reference signal such that said first frequency divider means provides a divide by n function;

phase comparator means ("PFD", "CP", and "LF" in Fig. 2) for receiving said first frequency divided signal and said second frequency divided signal, and for producing a

phase comparator signal (output from "LF" in Fig. 2) responsive to said first and second frequency divided signals;

oscillator means ("HF-VCO" in Fig. 2) for receiving said phase comparator signal (output from "LF" in Fig. 2), and for producing an output transmission signal ("A" in Fig. 2) having a frequency F_{OUT} responsive to said phase comparator signal such that $F_{OUT} = F_{LO} (1 \pm m/n)$ (see the mathematical expression in col. 4, line 49, also see right column on page 3 of the English translation of DE 19743207 provided by the applicant); and

feedback circuitry ("M1" and "TP" in Fig. 2) coupled to said output transmission signal ("A" in Fig. 2), coupled to said reference signal ("f_{LO}" in Fig. 2) and coupled to said quadrature modulation means ("QM" and "BP" in Fig. 2), said feedback circuitry for producing said feedback signal ("f_{MO}" in Fig. 2) responsive to said output transmission signal and said reference signal.

Herzinger does not teach that the translation loop modulator may be operated in a second mode such that $F_{LO} = F_{OUT} / (1 + m/n)$. That is, Herzinger does not teach the feature of dual band operation.

However, Damgaard teaches that there is a need for mobile phones to operate with dual band transmissions to increase system capacity, so that the system could select between two transmission frequency bands depending upon which bandwidth is less saturated and could provide a better signal quality (col. 1, lines 30-35). Damgaard also teaches the dual operation may be achieved by selecting the output of a mixer (with inputs RF_{OUT} and RF_{LO}) to be either $RF_{OUT} - RF_{LO}$ or $RF_{LO} - RF_{OUT}$ (col. 5, lines 53-62). When the mobile phone is operated in GSM mode, $RF_{LO} - RF_{OUT}$ is selected.

When the mobile phone is operated in DCS mode, RF_{OUT} - RF_{LO} is selected. (See col. 6, line 49 through col. 7, line 8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the output of the mixer ("M1" in Fig. 2) of Herzinger to be either $RF_{VCO} - RF_{LO}$ or $RF_{LO} - RF_{VCO}$ such that the modulator of Herzinger may be operated in dual band (DCS mode and GSM mode) for the advantage of increasing system capacity. Note that the relationship $F_{LO} = F_{OUT} / (1 + m/n)$ is an inherent property when the DCS mode (i.e., $RF_{VCO} - RF_{LO}$) is selected. Such relationship may be derived by simple mathematical manipulations.

Regarding claim **21**, as explained above in the rationale applied to claim 19, Herzinger in view of Damgaard may be operated in DCS mode (about 1800 MHz).

Regarding claim **22**, as explained above in the rationale applied to claim 19, Herzinger in view of Damgaard may be operated in GSM mode (about 900 MHz).

3. Claims 2, 3, 11, 12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzinger (EP 0,905,879) in view of Damgaard et al. (U.S. Patent No. 6,208,875, "Damgaard" hereinafter) as applied to claims 1, 5, 7-10, 14, 16-19, 21 and 22 above, and further in view of Jaffe (US Patent 5,130,670).

Regarding claim **2**, Herzinger in view of Damgaard teaches the claimed invention (see the rationale applied to claim 1 above) including an oscillating means ("LO" in Fig. 2 of Herzinger) for generating the reference signal ("f_{LO}" in Fig. 2 of Herzinger), but fails

to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration.

Jaffe teaches that an oscillating means (16' in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58', 66, 64', 60' and 62' in Fig. 7). The phase locked loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal.

It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal ("A" in Fig. 2 of Herzinger). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop, as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Regarding claim **3**, Jaffe teaches the claimed limitation "said reference loop modulator includes a fractional n synthesizer" because Jaffe teaches that the oscillating means 16' is a fractional n synthesizer (col. 16, lines 62-63).

Regarding claim **11**, Herzinger in view of Damgaard teaches the claimed invention (see the rationale applied to claim 10 above) including an oscillating means ("LO" in Fig. 2 of Herzinger) for generating the reference signal ("f_{LO}" in Fig. 2 of Herzinger), but fails to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration.

Jaffe teaches that an oscillating means (16' in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58', 66, 64', 60' and 62' in Fig. 7). The phase locked

loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal.

It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal ("A" in Fig. 2 of Herzinger). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop, as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Regarding claim **12**, Jaffe teaches the claimed limitation "said reference loop modulator includes a fractional n synthesizer" because Jaffe teaches that the oscillating means 16' is a fractional n synthesizer (col. 16, lines 62-63).

Regarding claim **20**, Herzinger in view of Damgaard teaches the claimed invention (see the rationale applied to claim 19 above) including an oscillating means ("LO" in Fig. 2 of Herzinger) for generating the reference signal ("f_{LO}" in Fig. 2 of Herzinger), but fails to teach that the oscillating means is a reference loop modulator, i.e., a feedback loop configuration.

Jaffe teaches that an oscillating means (16' in Fig. 4) is implemented with a phase locked loop (52', 54', 56', 58', 66, 64', 60' and 62' in Fig. 7). The phase locked loop comprises a stability enhancement circuit (66 in Fig. 7) so as to generate a stable output oscillating signal.

It is desirable to generate a stable reference signal in the translation loop modulator of Herzinger so as to generate a stable output transmission signal ("A" in Fig.

2 of Herzinger). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the oscillating means of Herzinger with a phase locked loop, as taught by Jaffe, so as to generate a stable reference signal and consequently to generate a stable output transmission signal.

Drawings

4. The proposed drawings correction received on 11/14/03 have been approved. The applicant is reminded that the Office still has received the formal drawings incorporating all of the previously submitted proposed drawing corrections

Response to Arguments

5. Applicant's arguments filed 11/14/03 have been fully considered but they are not persuasive.

(a) With respect to the Herzinger reference, the applicant states that the Herzinger reference discloses that the frequency plan is changed (e.g. from GSM to DCS) by varying the values of N and R of the frequency dividers. To support his argument, the applicant further quotes the Herzinger translation, page 5, left column, lines 8-12:

> The use of two dividers FT1 and FT2 with divider values of N and R, which may be different or the same, provides a high degree of freedom in determining the frequency plan.

Examiner's response --- The description quoted by the applicant only teaches that the use of two dividers provides a high degree of freedom in determining the frequency plan. However, Herzinger never teaches that "a high degree of freedom in determining the frequency plan" means "switching between a GMS system and a DCS system" as argued by the applicant. In fact, Herzinger specifically indicates his invention may utilize the GSM standard or the DCS standard (Herzinger translation, page 1, left column, lines 6-15). Therefore, it appears Herzinger's transmitter can only be used in one of the GSM and DCS standards, not both standards. Herzinger never teaches the feature of switching between the GSM and the DCS standards. Further, the goal of Herzinger's invention is to provide a transmitter in which the interference (i.e. spurious signal components) occurring in the prior art technology may be avoided (see translation page 2, left column, line 36 through right column, line 10). Herzinger never indicates that the goal of his invention is to provide a transmitter that is able to switch between the GSM and DCS standards. In particular, Herzinger states:

> The following consequences result when the local oscillator is tuned over a given range to cover the transmission band:
>
> The fMO frequency is not constant but changes as a function of the fLO frequency weighted with the ratio N:R.
>
> The phase comparison frequency fPD is similarly detuned as a function of the fLO frequency.
>
> The frequency pattern of the local oscillator LO is converted with a factor (R-N):R to the channel pattern of the high-frequency oscillator HF-VCO.
>
> The critical advantage of this phase-locked coupling of all frequencies occurring in the circuit is the avoidance of spurious signal components.

(see Herzinger translation, page 3, right column, lines 6-22).

It is also noticed that Herzinger describes his invention with GSM standard only throughout the whole document. Therefore, it is clear the description "a high degree of

freedom in determining the frequency plan" is referred to the determination of fLO, fMO, fVCO frequencies within a GSM system only. It is not referred to changing from GSM to DCS as argued.

(b) With respect to the Damgaard et al. reference, the applicant argues that Damgaard reference discloses that an IF VCO may be used that is adjustable to achieve the two different IF frequencies for the GSM and DCS signals. Filters and switches are then used to choose one or the other signal during transmission or reception and to remove the signal that is not being used. Any combination of the two references (i.e., Herzinger and Damgarrd) would likely result in a system that changes both a VCO and the value of one or more frequency dividers to achieve the dual band operation.

Examiner's response --- As indicated in this and previous Office Action, Damgarrd discloses a dual band (GSM and DCS) system that modulates a pair of baseband signals (I and Q) with a first IF signal for the GSM band or a second IF signal for the DCS band. The use of the first IF signal or the second IF signal depends on whether the bandpass filter 104 (Fig. 3) passes the $RF_{OUT} – RF_{LO}$ or $RF_{LO} – RF_{OUT}$ component of the mixer 92. When the system is operated in GSM mode, RF_{LO} - RF_{OUT} (high side rejection) is selected. When the system is operated in DCS mode, RF_{OUT} - RF_{LO} (low side rejection) is selected. (See claim 1; col. 5, lines 58-60; col. 6, lines 57-60; col. 7, lines 6-8) Therefore, Damgarrd teaches switching between GSM and DCS systems by selectively controlling the output of the bandpass filter 106 to be RF_{LO} - RF_{OUT} (GSM, high side rejection) or RF_{OUT} - RF_{LO} (DCS, low side rejection). On the

hand, referring back to the Herzinger reference, it is clear the bandpass filter TP (Fig. 2) of Herzinger only passes the RF_{LO} - RF_{OUT} component of the mixer M1 (which result in the relationship fVCO=FLO*(R-N):R or $F_{LO}=F_{OUT}/(1-N/R)$, which can be derived by simple mathematical derivation). Therefore, the examiner proposes a modification of Herzinger's system by incorporating the feature of selectively controlling the output of the bandpass filter to be RF_{LO} - RF_{OUT} or RF_{OUT} - RF_{LO}, as taught by Damgarrd, into the bandpass filter TP of Herzinger to achieve dual band operation. The combination of the two references will result in a system that selectively changes the output of the bandpass filter TP of Herzinger to achieve dual band operation. The argument that any combination of the two references (i.e., Herzinger and Damgarrd) would likely result in a system that changes both a VCO and the value of one or more frequency dividers to achieve the dual band operation is not persuasive.

Further, it appears that the applicant considers the novelty of his invention lies in that the circuit may operate such that $RF_{OUT} = RF_{LO} + RF_{IF}$ for DCS and $RF_{OUT} = RF_{LO} - RF_{IF}$ for GSM (see bottom of page 10 in the amendment). As explained above, such operation clearly has been taught by Damgarrd et al.

Based on the reasons above, it is believed the rejections should be maintained.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chieh M Fan
Primary Examiner
Art Unit 2634

cmf
February 18, 2004